UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 HANFORD/INL PROJECT OFFICE
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August 1, 2007

Mr. Matthew S. McCormick, Assistant Manager
for the Central Plateau
Richland Operations Office
U.S. Department of Energy
P.O. Box 550
Richland, Washington 99352

0073060

Re: PNNL-16454, 300-FF-5 Groundwater Operable Unit Current Conditions Baseline Risk Assessment

Dear Mr. McCormick:

The U.S. Environmental Protection Agency (EPA) has reviewed the subject document (PNNL-16454) and is providing comments in this letter. EPA believes that there are serious deficiencies in the document. Some of the deficiencies may need to be corrected now, and others will need to be addressed after additional site investigation. However, because DOE has previously committed to aggressively pursuing remediation of the uranium contamination in the 300 Area groundwater to restore the aquifer to below drinking water standards, there is less urgency to finalize the risk assessment. The uranium contamination constitutes the primary risk from the 300-FF-5 operable unit.

An update of the risk assessment will be more appropriately performed during the future remedial investigation/feasibility study (RI/FS) process than during the current Phase III Feasibility Study. The future RI/FS process will include all contaminants of concern and will lead to a final Record of Decision (ROD) for the 300 Area soil, vadose zone, and groundwater. Schedules for when this comprehensive RI/FS will be performed are currently under negotiation by the Tri-Party Agencies.

Two options exist for revising the subject document. The risk assessment can remain in draft form until such time as it can be updated with all required information, including new information pertaining to the high TCE concentrations, remaining in draft form until the comprehensive RI/FS process is underway. Option two is to address concerns in the draft document by accurately describing the deficiencies in the draft risk assessment and describing how and when in the future these deficiencies will be addressed by another revision of the document during the comprehensive RI/FS process. The following comments must be addressed in the updated risk assessment:

General Comments

- Land use scenarios must be analyzed with no remedial actions, including institutional controls, for a true baseline risk assessment. Institutional controls, such as groundwater use restrictions, are considered part of an active remedy, yet were used for all scenarios in this risk assessment. Please evaluate exposure scenarios that do not include any institutional controls.
- Although a drinking water only scenario was evaluated, it should be incorporated into other scenarios to determine the cumulative risk of all possible exposure pathways.
- An unrestricted type scenario must be evaluated in the risk assessment. The Explanation of Significant Differences for the 300-FF-2 Operable Unit Record of Decision (EPA, May 2004) modified the soil cleanup levels for eight waste sites to unrestricted use levels, including the four in the 618-10/316-4 subregion. EPA would like to see rural residential as well as a tribal use scenarios analyzed, as these can be considered bounding scenarios. These scenarios would also illustrate the risks associated with failure of institutional controls throughout the 300 Area.
- A discussion of the relationship of the 300-FF-5 risk assessment to other Hanford risk assessment activities will need to be added. Detailed information on similarities and differences between the exposure scenarios, data collection methods, and uses from the compared risk assessments will need to be addressed.
- Both the EPA and members of the public are concerned about the recently discovered TCE plume, which is not addressed by the current draft of the Risk Assessment. The risk from all contaminants in the 300-FF-5 operable unit will need to be evaluated, including the high concentrations of TCE. However, this update should not occur before more information is known about the nature and extent of the TCE contamination, which is currently under further investigation.

If DOE chooses to finalize this document at this time, as outlined earlier by my description of option two, a section must be added to PNNL-16454 to summarize areas of risk that are not addressed in this assessment. This summary should acknowledge the as yet unknown risk from recently discovered high concentrations of TCE, as well as the unknown cumulative risk from scenarios that include groundwater usage and unrestricted use scenarios. As previously stated, the discussion should also address how these deficiencies will be addressed in future revisions.

The comments listed below are items that must be addressed before PNNL-16454 can be published as a final document.

Specific Comments

1) The summary (page iii) misrepresents the conclusions of the 2006 CERCLA Five-Year Review. The 2006 review stated that the remedy at 300-FF-5 was not protective. The review allowed that human exposures were currently controlled by institutional controls, but did not conclude that the interim remedy was acceptable. No additional requirements were made during the 2006 review because the focused feasibility study was already in progress.

2) It appears that the majority of groundwater samples were filtered prior to metals analyses. Filtration is considered a treatment alternative and this data does not properly represent baseline conditions for metals.

3) The risk assessment does not provide a conceptual exposure model showing the sources, transport and release mechanisms, exposure points, exposure routes, or exposed human or ecological populations considered.

4) For reproducibility purposes, Section 3 should include a list of well names, sample ID, collection dates, and hydrological unit.

5) Page 4.8 There is an apparent inconsistency in the discussion of ecological benchmarks, which are described as having "no detectable adverse effects to populations of plants and animals" (which seems equivalent to a NOAEL) but are described subsequently as "lowest observable adverse effects levels (LOEAL)." Suggest adding additional text describing uncertainty factors or other means to assure that the LOEAL has been applied to provide a NOAEL level of protection.

6) Page 4.14, Figure 4.5 Comparisons between ECEM and observed levels of Strontium 90 in carp indicate that predictions are closer to central tendency observations, but the text describes ECEM as representative of maximum observations. Three observations occur at levels approximately twice as high as the ECEM estimate.

7) Page 4.15 It would be helpful to list the half-life of tritium in the text at the end of section 4.6.1.

8) Page 5.1 Please clarify that cancer risk estimates represent the *incremental* increase in the likelihood of developing cancer. Suggested example from (U.S. Environmental Protection Agency Region 10, 2005):

> Carcinogenic risks are characterized as an excess probability of developing cancer over a lifetime (i.e., an increased risk of developing cancer attributable to exposures to site-related contaminants). Cancer risk estimates are the product of exposure assumptions (i.e., intake) and the chemical specific CSF. Excess individual lifetime cancer risk is typically estimated by multiplying the estimated chemical intake by the CSF, as follows:
>
> Cancer Risk (unitless) = Chemical Intake (mg/kg-day) x CSF $(mg/kg\text{-}day)^{-1}$
>
> The CSF typically represents an upper 95^{th} percentile estimate of the dose response relationship. However, radiological CSFs are based on central tendency estimates of cancer potency. An impossible event has a probability of 0 and a certain event has a probability of 1. Most events are possible, but are less than certain, meaning the probability is between 0 and 1. The increased likelihood of cancer from exposure to a particular chemical is defined as an excess individual lifetime cancer risk, as distinct from risks that are not associated from a particular exposure scenario on the site.

9) Page 5.10 The CERCLA default soil ingestion rate for children is 200 mg/day (not 100 mg, as indicated in the text). This value represents the minimum value for an outdoor recreational exposure scenario near a body of water, where soil ingestion is likely to be elevated above typical residential levels (U.S. Environmental Protection Agency, 1991; van Wijnen, Clausing & Brunekreef, 1990). The HUMAN code should be checked to

ensure consistency with the cited reference (U.S. Environmental Protection Agency, 1991) and soil and sediment ingestion rates listed in Table 5.5 should be doubled. If the HUMAN code is erroneous, then other Hanford Assessments may need to be re-examined.

10) Page 5.16, Table 5.8 Verify cancer slope factors for tetrachloroethylene are 5.4×10^{-1} and 1.7×10^{-1} for oral and inhalation exposure, respectively. These values are correctly listed and cited in the footnotes to Table 5.8, but they are incorrectly listed within the Table. These values were verified against the RAIS website on June 4, 2007: http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad

11) Page 6.4 – 6.5 Correct: *Error! Reference source not found*

12) Page 7.4 Please verify citation for Eslinger, Miley, Arimescu, and Kanyid, 2006. The PNNL Report number is listed as 16115 by the Hanford Technical Library Catalog: http://rrcatalog.pnl.gov/rrcat/search.cfm

28381 PNNL-16115 UPDATED USER INSTRUCTIONS FOR THE SYSTEMS ASSESSMENT CAPABILITY, REV.1, COMPUTER CODES; VOLUME 1: INVENTORY, RELEASE, AND TRANSPORT MODULES; VOLUME 2: IMPACT

EPA understands that members of the public have a high level of interest in the 300 Area, including the groundwater contamination. There will be many different perspectives regarding the ongoing investigations in the 300-FF-5 operable unit during the public meeting scheduled for August 29, 2007. It is EPA's assumption that the public will also request a separate public forum specifically to discuss the results of the 300-FF-5 risk assessment. EPA would like to work with DOE on a strategy for finalizing the risk assessment, as well as continuing coordination of further investigations and assessments in the 300 Area. Please contact me at (509) 376-4919 regarding these comments and your proposed responses.

Sincerely,

Alicia Boyd

Alicia Boyd
300 Area Project Manager

cc: Mike Thompson, DOE
Cheryl Whalen, Ecology
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